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Abstract

We examine the impact of the values *respect for others* and *responsibility* on productivity and the accumulation of physical and human capital for a sample of 58 countries. We find that these two core values are important and that their impact is substantial. *Respect for others* works primarily through productivity whereas *responsibility* is important to investment in physical and human capital. We also show that respect and responsibility are embedded in institutions and may overcome the negative macroeconomic effects associated with fractionalized societies.

1   Introduction

In an influential paper, Hall and Jones (1999) argue that the enormous variation in output per worker across countries is driven by differences in social infrastructure. They show that countries with stronger anti-diversion policies and institutions achieve higher levels of investment in human and physical capital, greater productivity, and higher levels of output per worker. In a similar vein, Acemoglu et al. (2001) identify colonial origins as the deep determinant that has shaped institutions and government policies and therefore explains differences in standards of living today. Mauro (1995) sees corruption, due to ethnic division, as responsible for the lack of development. Knack and Keefer (1997) claim that trust and civic norms are important determinants of output per capita and investment.

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The link from culture to trust to economic performance is established by Guiso et al. (2009) in their analysis of European trade and capital flows.

Each of these papers drills down into the sources of economic growth. Our work goes a step further and considers the role of two personal virtues or *values*: *respect for others* and *responsibility*. To date, the literature on economic growth has been largely silent on the role of values. There are exceptions. Tabellini (2008b), building on the work of Bisin and Verdier (2001), constructs a model of parent-child transmission of values and uses it to explain the persistence of economic institutions over centuries.[1] In our view, individual values are important because they determine the basis for how a person relates to others. Values therefore determine behavior one-on-one, in small groups, or in large, impersonal organizations – all settings in which production occurs.

We see two channels through which *respect for others* and *responsibility* matter to production. First, they may foster the accumulation of physical and human capital and productivity through a desire to invest in education and new technologies. Second, these two values may lie behind social capital, policies, and institutions. Because good institutions curtail corruption and promote trust, they are associated with higher levels of investment in physical and human capital. Respect for others and responsibility may influence the structure of institutions that protect property and human rights, promote policies that endeavor to improve the health and education of people, and naturally facilitate generalized trust outside of family ties and clans. Cross-country differences in these two values may fundamentally explain differences in productivity, capital intensity and human capital and therefore output per worker around the world.[2]

We use data from the World Values Survey, 2006 to measure the values *respect for others* and *responsibility*. We use this data, along with the Penn World Table v.6.2 (Heston et al. (2006)), to investigate the impact of our two values on output per worker and its three component parts – productivity, capital intensity, and human capital. In basic OLS regressions, we see a pattern that persists through various specifications: *respect for others* works primarily through productivity, while *responsibility* influences the accumulation of physical capital and human capital. The effects are large and significant. The two values together are statistically significant in explaining 46% of the cross-country variation in output per worker.

Trust is often considered an important determinant of economic outcomes. However, in our tests, we find no role for it once respect and responsibility are introduced. A corol-

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[1]In his presidential address to the European Economic Association, Tabellini (2008a) called for more research on how individual values influence institutional outcomes.

[2]President Obama made *responsibility* a centerpiece of his speech given to school children on September 8, 2009; see http://www.whitehouse.gov/MediaResources/PreparedSchoolRemarks.

lary to our view is that where respect for others and responsibility are strong, ethnic and religious fractionalization need not be associated with lower levels of capital accumulation and productivity. A large body of work finds that societal divisions hurt economic performance.[3] Yet, these findings ignore values. It is possible that in societies where good values are embraced, ethnic and religious divisions may not be negatively correlated with economic progress. We find that inclusion of core values eliminates the negative impact of fractionalization on capital accumulation and productivity in many cases. In others, while the negative effect remains, the magnitude of the effect is more than offset by the positive impact of core values.

We also investigate whether core values affect the quality of institutions. Institutions are human creations and so it is natural to suspect that they will embed values shared by a society. We find support for this idea, too. *Respect for others* and *responsibility* have positive and significant effects on social infrastructure, civil liberties, property rights, and economic freedom. We then backpedal and consider the possibility that values affect capital intensity, human capital, productivity, and output per worker *only* through institutions. When we regress our production components on institutions, and instrument for institutions with our two values, we find institutions have a positive, statistically significant effect. Our findings suggest an alternative interpretation to Hall and Jones (1999) claim that social infrastructure is critical to production. Institutions may matter because fundamentally, they capture the core values a society shares.

Lastly, we consider the possibility that other values that may be important to production have been omitted from our analysis. We consider eight other values like "hard work", "independence" or "determination and perseverance" . When we include these other values individually along with *respect* and *responsibility,* we find the pattern established in the OLS results remains. *Respect for others* is significant in explaining productivity and output per worker whereas *responsibility* is significant in explaining physical and human capital and output per worker.

The paper is organized as follows. In Section 2 we elaborate on the effect of core values on economic outcomes. In Section 3 we describe our data and its sources. In Section 4 we set out our empirical strategy and report results from OLS regressions with our values as the main regressors. We then include trust in our specifications. Here we also explore whether values can overcome negative effects associated with fractionalization. In Section 5 we investigate how values shape institutions and consider whether values work only through institutions. In Section 6, we test the robustness of our results to the inclusion of eight other values. Section 7 concludes.

[3]See Easterly and Levine (1997), Alesina and Ferrara (2005), Montalvo and Reynal-Querol (2005).

2   Core Values and Production

We call respect for others and responsibility *core values* because we believe they reflect deeply-held beliefs that guide one's behavior. They cannot be altered in response to economic incentives; they are exogenous. Core values act as a restraint on the rational economic agent and are consistent with evidence of the existence of altruism, kindness, and other puzzles to utility maximization pervasive in the literature on experimental economics, financial economics, sociology, and psychology.[4]

Our first core value, *respect for others,* is a rough measure of how seriously people take the Golden Rule. This code of conduct, prominent in nearly all religions and cultures, encourages people to act honestly and fairly when dealing with others, regardless of social distance. Individuals who respect others are more likely to be trustworthy in both production and exchange. Trustworthy individuals prevent output losses associated with shirking and cheating and thus enable output to be maximized. Trustworthiness also fosters trust, which is necessary for the functioning of any modern economy. Respect for others is a broad, generalized value that may also manifest as a desire to protect the rights of others where there is no familial tie or other close relationship.

Our second core value, *responsibility*, is relationally more specific than *respect for others.* To be responsible means to be ethically accountable for the care or welfare of oneself or another – typically in instances where there is a defined relationship. Whereas *respect* is broad and is assumed to be conferred by one person to anyone, *responsibility* emerges in relationships where there is likely to be a familial, school, or workplace tie. Responsibility for oneself may be demonstrated as a willingness to invest in one's future by accumulating human and physical capital. Responsibility for others assumes an individual fulfills his or her duties to others. In our view, individuals who are more responsible are more likely to complete their tasks and participate more fully in production.

Our conception of the way that core values affect output is shown in Figure 1. Core values influence behavior directly, as described above, but also indirectly through the design of institutions. Thus, we view values as the deep driver of productivity, input accumulation, output per worker, and institutions through which behavior may be mediated. High-quality institutions have been linked to greater living standards in the work of Hall and Jones (1999), Easterly and Levine (1997), Temple and Johnson (1998), Alesina et al. (2003), Guiso et al. (2004), and Acemoglu and Johnson (2005), among other recent work. High-quality insitutions minimize transactions costs, smooth the wheels of technology transfer,

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[4]To the extent that core values generate positive externalities, aggregate utility and profits may in fact be greater than aggregate utility and profits assuming rational economic agents.
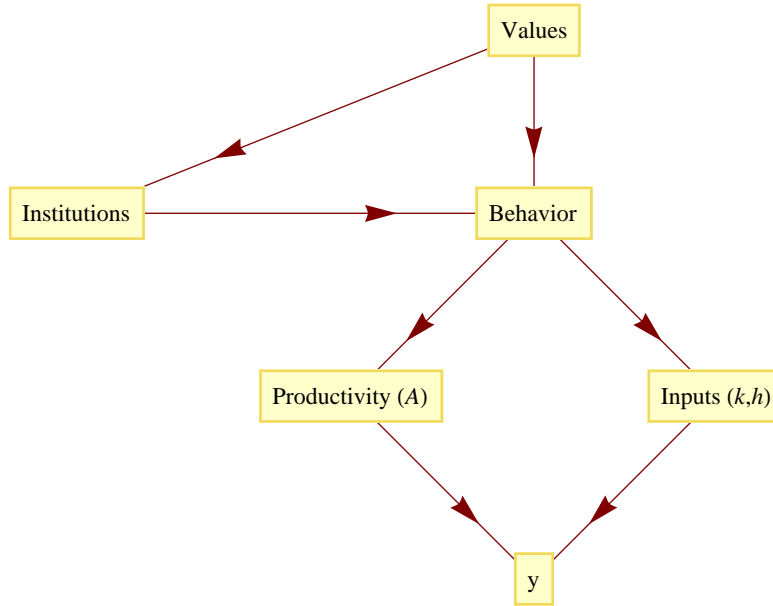
Figure 1: Relationships

promote innovation through well-defined property rights, and secure investments in health and education for large segments of society. All of these lead to more efficient and productive inputs to production.

Our work also offers an explanation for the persistence in institutions and underdevelopment that is addressed by Rajan and Zingales (2006) and Acemoglu (2008) using models of interest groups and the political process. Because core values are likely to be highly persistent (Tabellini, 2008b), they may be able to explain the persistence of institutions. Glaeser et al. (2004) find that human capital is more essential for economic growth than are good instituitons. Our work suggests that core values may raise human capital both directly and through better education policies.

Finally, we see our core values, *respect for others* and *responsibility*, as distinct from culture. It is our view that values may be shared by diverse cultures and do not define them. While "culture" is commonly distinguished by ethnicity, linguisitics, or religious faith, core values may span these cultural divides and indeed make them inconsequential in economic exchange.

3 Data

3.1 Values

The World Values Survey (2006), extensively used by researchers from many different areas of the social sciences, provides us with data pertaining to individuals' values. The number of respondents varies across countries but typically ranges from 1,000-1,300. We use responses from the 1995 (Wave 3) and 2000 (Wave 4) editions. Where there are duplicate countries across Waves 3 and 4, we use data from the most recent wave only. We select the following survey question:

> "Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you feel to be especially important? Please choose up to five (CODE FIVE ONLY)."

The question is followed by a list of eleven qualities[5] in order as:

> good manners, independence, hard work, feeling of responsibility, imagination, tolerance and respect for others, thrift saving money and things, determination and perseverance, religious faith, unselfishness, and obedience.

We select response rates to *tolerance and respect for others (respect,* for short) and *feeling of responsibility (responsibility,* for short) to measure core values. Table 1 reports the percentage of respondents selecting each of the core values for a sample of fifteen countries. We also report response rates averaged across *OECD* and *non-OECD* countries. There are twenty-three *OECD* countries and thirty-five *non-OECD* countries. The full sample average, standard deviation, and range are also reported. Appendix A presents the data for each country in our sample.

In constructing the response rates, we had to correct for overresponses because some respondents selected more than five values. To correct, we dropped individuals who selected more than five values.[6] Overall, we see that descriptive statistics on *respect* and *responsibility* are similar. They each average about 70% and have standard deviations and ranges that are similar. There is about an equal split between the fifteen countries where *respect for others* is higher than *responsibility* and vice-versa. However, a look at the correlation between the two values in Table 2 shows it is quite low at 0.28.

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[5]In the World Value Survey, the questions begin with A027 and end with A043. We select only those qualities that were asked in Waves 3 or 4.

[6]Iran had the largest share of overresponders; 38% selected more than five values. For thirty-nine countries, overresponse rates were less than 5%. There were three countries with no responders selecting more than five values.

Table 1: Data: Selected Countries and Groups

Country	Respect	Responsibility	A	k^ρ	h	y
United States	0.80	0.72	1.00	1.00	1.00	1.00
Argentina	0.69	0.76	0.44	0.93	1.02	0.42
Canada	0.82	0.77	0.73	1.07	0.95	0.74
China	0.72	0.64	0.14	0.93	0.78	0.10
France	0.85	0.73	0.74	1.10	1.01	0.82
Germany	0.71	0.82	0.77	1.17	0.84	0.76
India	0.58	0.63	0.16	0.68	0.82	0.09
Ireland	0.75	0.52	1.22	0.90	0.80	0.88
Japan	0.71	0.91	0.61	1.30	0.84	0.66
Mexico	0.71	0.77	0.36	0.94	0.86	0.29
Russian Fed.	0.68	0.76	0.26	1.11	0.89	0.26
Singapore	0.69	0.81	0.72	1.24	0.99	0.88
Sweden	0.92	0.87	0.69	1.07	0.94	0.69
Uganda	0.56	0.55	0.14	0.36	0.65	0.03
United Kingdom	0.79	0.47	0.92	0.97	0.82	0.73
Average by Income Group						
OECD	0.77	0.73	0.73	1.10	0.92	0.73
non-OECD	0.65	0.69	0.34	0.86	0.84	0.27
Entire Sample						
Range	.43-.92	.47-.92	.13-1.21	.36-1.29	.60-1.05	.03-1.0
Overall Average	0.70	0.72	0.50	0.96	0.87	0.45
Overall Std. Dev.	0.11	0.12	0.26	0.19	0.10	0.28

3.2 The Components of Production

Output in each country is produced according to:

$$Y = K^{\alpha} (AH)^{1-\alpha} \qquad (1)$$

where Y is total output, K is the capital stock, A is productivity, and H is total human capital. As is standard, $H = hL$, where h is individual human capital and L is the number of workers. Following Hall and Jones (1999), we express output per worker $y \equiv \frac{Y}{L}$ as:

$$y = Ak^{\rho}h \qquad (2)$$

where $k \equiv \frac{K}{Y}$ is the *capital intensity* and $\rho \equiv \frac{\alpha}{1-\alpha}$.

We decompose output per worker into each of its components in (2). Our data for y comes from the Penn World Table (Heston et al. (2006)) – we use the $RGDPWK$ series. We construct our own capital series using the perpetual inventory method.[7] To get capital intensity, we divide our capital series by $RGDPCH$ from the Penn World Table. For h, we use the method of Hall and Jones (1999). They assume that the logarithm of h is related to years of schooling in a piece-wise linear manner.[8] Our data for years of schooling comes from Barro and Lee (2001). Finally, we set $\alpha = .33$, which is a standard value. Productivity A is found as the residual once the other series in (2) have been constructed.

The last four columns of Table 1 show output per worker and the three components in (2) for fifteen selected countries and averages by the OECD indicator – relative to the United States. Appendix A contains data for the full list of countries. The decomposition updates estimates on these three components and output per worker reported in Hall and Jones (1999). As in their work, we see substantial variation in output per worker across countries. The variation appears most notably linked to large differences in productivity A across the sample. The country with the highest productivity is Ireland and the country with the lowest productivity is Uganda. Differences in k^{ρ} and h are most pronounced for the low income countries.

In Table 2, we see the correlation between y and A (in logs) is 0.94 which is close to

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[7] We constructed K in two steps. First, we found the initial capital stock: $K_0 = \frac{I_a}{g+\delta}$. In this expression, I_a is the average of the first four observations of investment in each country, g is technology growth and δ is depreciation. We assume $g = .02$ and $\delta = .06$ in all countries. Second, we applied the recursive formula $K_{t+1} = (1 - \delta) K_t + I_t$ to fill out later values of K. We use the earliest observation possible, which is 1960 in most cases.

[8] For 1 to 4 years, the return to schooling is 13.4 percent; for the next four, 10.1 percent; after that, it is 6.8%. These are average rates of return for, respectively, Sub-Saharan Africa, the world, and the OECD, as measured by Psacharopoulos (1994).

Table 2: Correlations

	Respect for others	Responsibility	A	k^ρ	h	y
Respect for others	1					
Responsibility	0.28	1				
A	0.59	0.39	1			
k^ρ	0.39	0.50	0.49	1		
h	0.31	0.53	0.46	0.53	1	
y	0.59	0.51	0.94	0.73	0.64	1
Correlations for A, k^ρ, h, and y use logs of each series.						

the estimate of 0.89 in Hall and Jones (1999). Table 2 also shows that *respect for others* and *responsibility* are positively correlated with our components of production, A, k^ρ, h, and y. We turn next to an empirical examination of core values and the components of production.

4   Empirical Strategy

Our basic model is based on Figure 1:

$$Z_j = \alpha_0 + \alpha_1 Respect_j + \alpha_2 Respon_j + \alpha_3 I_j + \varepsilon_j \tag{3}$$

where Z_j represents the log of one of the following: A_j, k_j^ρ, h_j, or y_j. The variable I_j is a measure of the quality of institutions. Our primary institutional measure is the *Index of Property Rights* constructed as part of the *Index of Economic Freedom* by the Heritage Foundation.[9] Our theory suggests that values and institutions will be correlated, which we will deal with in Section 5. For now, we may think of α_1, α_2 as capturing the direct effect of values on Z and α_3 as capturing the indirect effect of values on Z. Both values and institutions exert an influence on outcomes through *behavior*, which is unobserved. Finally, ε_j is the error term. We hypothesize that our parameters of interest $\alpha_1, \alpha_2, \alpha_3 > 0$.

4.1   Baseline Results

The first set of results we present uses OLS to estimate (3) with and without the institutional variable. These are reported in Table 3, panels A, B, C, and D. In the first two columns

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[9]Acemoglu and Johnson (2005) use this as one of their main measures of institutional quality.

of each panel, we include either *respect for others* or *responsibility* separately. In the third column, we include both. Column 4 of each panel includes the *Property Rights* measure.[10]

Table 3 reveals a pattern that we will see repeated throughout the paper: *respect for others* works through productivity A, whereas *responsibility* works through the capital intensity k^ρ and human capital h. Both values are highly significantly related to output per worker y.

Panel A reports the results for productivity. When *respect for others* or *responsibility* is included alone, each core value is statistically significant and positive across all specifications. *Responsibility* loses significance, however, when it is included with *respect,* without or with the *Property Rights* measure. By itself, *respect for others* accounts for 34% of the cross-country variation in productivity and rises substantially with the inclusion of the *Property Rights* measure. We find that for productivity, a 1% point increase in *respect for others* corresponds to a rise in productivity between 1.5-2.9 percentage points.

Panel B reports the results for these same specifications for capital intensity.[11] Without the *Property Rights* measure, we see that *respect for others* and *responsibility* are positive and significant and jointly explain 29% of the cross-country variation in k. With the inclusion of *Property Rights*, however, only *responsibility* retains significance. Our estimates suggest that a 1% point rise in *responsibility* will raise capital intensity by 0.72 percentage points or more.

Panel C reports the results for human capital. *Respect for others* loses significance when *responsibility* is included. On the other hand, *responsibility* retains significance across all specifications. The overall explanatory power of *responsibility* alone is 27%. The result is consistent with our hypothesis that an individual's decision to invest in human capital will be positively correlated with the value they place on being responsible. However, the effect of core values on h is smaller than those reported for k or A. Countries with a *responsibilty* score that is 1% point higher will see human capital 0.4-0.5 percentage points higher.

Our decomposition of y suggests that the effect of values should stem from their separate effects on A, k^ρ, and h. Panel D reports the results for y. Looking across the specifications, we see that these values have a positive, statistically significant effect on output per worker, with or without *Property Rights*. When both values are included, 46% of the variation in cross-country output is explained. Inclusion of the *Property Rights* measure raises the explanatory power to 67%. The overall effect of these values is large. Without controls, our results suggest that a 1% point increase in each of these values will collectively increase

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[10]We also run specifications including six regional dummies or an *OECD* dummy. The pattern of results is very similar.

[11]When we use the term "capital intensity", we mean it to refer to k^ρ.

Table 3: OLS

	Panel A: Dependent = A				Panel B: Dependent = k^ρ			
Respect for others	3.27** [0.00]		2.89** [0.00]	1.59** [0.00]	0.86** [0.00]		0.59* [0.02]	0.33 [0.18]
Responsibility		1.93* [0.01]	1.19 [0.11]	0.19 [0.72]		1.00** [0.00]	0.85** [0.00]	0.72** [0.01]
Property Rights				0.32** [0.00]				0.05 [0.13]
Constant	6.76** [0.00]	7.64** [0.00]	6.16** [0.00]	6.56** [0.00]	-0.28 [0.20]	-0.39+ [0.05]	-0.70** [0.01]	-0.63* [0.02]
Observations	58	58	58	55	58	58	58	55
Adj. R^2	0.34	0.14	0.39	0.61	0.14	0.24	0.29	0.31

	Panel C: Dependent = h				Panel D: Dependent = y			
Respect	0.36* [0.02]		0.2 [0.13]	0 [0.99]	4.49** [0.00]		3.68** [0.00]	1.91** [0.00]
Responsibility		0.55** [0.00]	0.50** [0.00]	0.40** [0.00]		3.48** [0.00]	2.54** [0.01]	1.31* [0.05]
Property Rights				0.05** [0.00]				0.42** [0.00]
Constant	0.44** [0.00]	0.29** [0.01]	0.19 [0.15]	0.23+ [0.07]	6.92** [0.00]	7.54** [0.00]	5.65** [0.00]	6.16** [0.00]
Observations	58	58	58	55	58	58	58	55
Adj/ R^2	0.08	0.27	0.28	0.39	0.34	0.25	0.46	0.67

Notes: Robust p values in brackets. **significant 1%; * at 5%.

output per worker by 6.1%. The inclusion of the *Property Rights* measure dampens the effect, but it still remains large at 3.3%.[12]

Overall, we find strong empirical support that our two core values contribute positively to production per worker. In nearly all cases, where one or both of the core values are statistically significant, we see levels of statistical significance of 3% or higher. Moreover, *respect* works through A while *responsibility* works through k^ρ and h.

4.2 Core Values and Trust

There has been much empirical work that examines the influence of trust on economic outcomes (Knack and Keefer, 1997; Zak and Knack, 2001; and Guiso et al., 2009). In this subsection, we include the well-known trust question from the World Values Survey (2006) as a control X_j in (3), to see if it adds anything to the determination of y or its components. The question reads:

"Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people? 1. Most people can be trusted. and 2. Can't be too careful."

The percentage of respondents selecting *"Most people can be trusted"* corresponds to our measure of trust.

Table 4 reports the results where we now include *trust* and our two core values, with and without the *Property Rights* measure. For each of these series, the empirical results differ little from those reported above. Trust has no impact on the components of production or overall output per worker.[13] *Respect* remains significant for productivity and output per worker. *Responsibility* remains significant for capital intensity, human capital, and productivity.

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[12]Breuer and McDermott (2008) show that output per capita (not per worker) is closely related to *respect* (which they label "intrinsic trustworthiness"). They do not however, consider responsibility or the separate components of output.

[13]If we are willing to accept a 7% marginal significance level, we see that *trust* has a *negative* and significant effect on h when the OECD dummy is included. It is possible that in richer countries, the more trusting an individual is in others (or the government), the less likely he or she is to make investments in h. In other words, *trust* may mitigate the impact of *responsibilty* in countries where the social safety net is likely to be larger. We see that a 1% point increase in responsibility raises human capital by 0.5% but that *trust* reduces it by 0.15%.

Table 4: Trust and Core Values

	Panel A: Dependent =A		Panel B: Dependent = k^ρ	
Trust	0.49	0.35	0.19	0.16
	[0.25]	[0.39]	[0.24]	[0.46]
Respect	2.70**	1.46*	0.52*	0.27
	[0.00]	[0.01]	[0.03]	[0.29]
Responsibility	1.04	0.09	0.79**	0.68*
	[0.17]	[0.85]	[0.00]	[0.01]
Property Rights		0.32**		0.05
		[0.00]		[0.11]
Constant	6.26**	6.62**	-0.66*	-0.60*
	[0.00]	[0.00]	[0.01]	[0.03]
Observations	58	55	58	55
Adj. R^2	0.39	0.61	0.3	0.31
	Panel C: Dependent = h		Panel D: Dependent = y	
Trust	-0.09	-0.13	0.59	0.38
	[0.30]	[0.17]	[0.24]	[0.52]
Respect	0.23+	0.05	3.45**	1.77*
	[0.08]	[0.76]	[0.00]	[0.01]
Responsibility	0.52**	0.44**	2.35*	1.21*
	[0.00]	[0.00]	[0.01]	[0.05]
Property Rights		0.05**		0.42**
		[0.00]		[0.00]
Constant	0.17	0.21+	5.77**	6.22**
	[0.19]	[0.10]	[0.00]	[0.00]
Observations	58	55	58	55
Adj R^2	0.28	0.4	0.47	0.67
Notes: Robust p values in brackets. **significant 1%; * at 5; + at 10%.				

4.3 Core Values and Societal Divisions

Empirical work by Mauro (1995), Easterly and Levine (1997), Alesina and Ferrara (2005), and Montalvo and Reynal-Querol (2005) report that societies that are highly fractious or polarized along ethnic or religious lines will be underperformers. Societal divisions may bring civil conflict, corruption, mistrust, and oppression not experienced in more homogeneous societies. Therefore, it is unsurprising that countries where ethnic and religious tensions flame also see lower standards of living, education, investment, and productivity.[14] We question whether *respect for others* and *responsibility* may ameliorate the negative influences of societal divisions on physical and human capital accumulation, productivity, and output per worker.

To test our idea, we investigate the effect of ethnic fractionalization on A, k^{ρ}, h, and y using data from Alesina et al. (2003). We first regress our outcome variables on ethnic fractionalization alone. These results are reported in the first column of each of the panels in Table 5. Ethnic fractionalization has a statistically significant negative effect on A, k^{ρ}, and y and on average explains about 14% of the cross-country variation in each. We also investigate (but do not report) the influence of religious fractionalization, ethnic polarization, and religious polarization on our production components.[15] Religious polarization alone among these has a negative, statistically significant effect on A, k^{ρ}, h, and y.

Next, we add our two core values alongside ethnic fractionalization. The results are reported in the second column of each panel. Accounting for core values removes the statistical significance of ethnic fractionalization wherever it was significant. At the same time, the core value *respect* remains significant for A and y; and *responsibility* remains significant for k^{ρ} and h. In the third column of each panel, we include the *Property Rights* measure and obtain the same result. Ethnic fractionalization remains insignificant and the core values reported in earlier tables remain significant.

We find, but do not report, similar results for religious polarization. However, despite the inclusion of core values, religious polarization remains negative and statistically significant. However, the coefficient estimate is smaller than the coefficient estimate on the (significant) core value. The evidence is consistent with our idea that core values may offset, if not completely eliminate, the negative effects of ethnic or religious divisions on aspects of production.

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[14]There is an alternative view. Fractionalized societies are more diverse and therefore more likely to bring variety, imagination, and better problem solving to the production process. It is possible, therefore, that fractionalized societies could achieve better economic growth rates. See Alesina et al. (2000), and Lazear (1999).

[15]Polarization is a measure of societal division that reaches a maximum when there are two groups. Fractionalization rises with the number of groups. See Montalvo and Reynal-Querol (2005).

Table 5: Societal Fractionalization and Core Values

	Panel A: Dependent = A			Panel B: Dependent = k^ρ		
Ethnic Fractionalization	-0.94** [0.00]	-0.41 [0.18]	-0.04 [0.87]	-0.41* [0.03]	-0.25 [0.13]	-0.25 [0.16]
Respect		2.66** [0.00]	1.57* [0.00]		0.45 [0.06]	0.23 [0.29]
Responsibility		1.06 [0.16]	0.19 [0.72]		0.77** [0.00]	0.71** [0.01]
Property Rights			0.32** [0.00]			0.04 [0.34]
Constant	9.33** [0.00]	6.54** [0.00]	6.59** [0.00]	0.46** [0.00]	-0.47 [0.06]	-0.41* [0.08]
Observations	58	58	55	58	58	55
Adj. R^2	0.12	0.40	0.61	0.14	0.33	0.35

	Panel C: Dependent = h			Panel D: Dependent = y		
Ethnic Fractionalization	-0.11 [0.24]	-0.02 [0.82]	0.04 [0.64]	-1.46** [0.01]	-0.67 [0.13]	-0.25 [0.56]
Respect		0.19 [0.18]	0.01 [0.94]		3.30** [0.00]	1.82** [0.00]
Responsibility		0.49** [0.00]	0.40** [0.00]		2.33* [0.01]	1.30* [0.04]
Property Rights			0.05** [0.00]			0.40** [0.00]
Constant	0.72** [0.00]	0.21 [0.17]	0.20 [0.13]	10.51** [0.00]	6.28** [0.00]	6.38** [0.00]
Observations	58	58	55	58	58	55
Adj. R^2	0.02	0.27	0.38	0.15	0.49	0.67

Notes: Robust p values in brackets. **significant 1%; * at 5%.

5 Core Values, Institutions, and Production

5.1 Core Values and Institutions

One part of our hypothesis is that values are built into institutions. We expect that in countries where *respect for others* and *responsibility* are pervasive, citizens are likely to have established institutions that uphold these values. If true, then we should expect that these core values also determine the quality of institutions. We test this idea using the following specification:

$$I_j = \beta_0 + \beta_1 Respect_j + \beta_2 Respon_j + \nu_j \tag{4}$$

We consider four different indices of institutions:

- *social infrastructure S*

- *index of economic freedom IEF*

- *property rights PR*

- *civil liberties CL*

All of the indices are adjusted so that higher numbers correspond to better quality institutions. We expect β_1 and $\beta_2 > 0$.[16]

The data on S comes directly from Hall and Jones (1999). This is an average of $GADP$ (an index of government antidiversion policy from Political Risk Services) and the fraction of years the country had been open (in the sense of Sachs and Warner, 1995) between 1950 and 1994. The $GADP$ index includes measures of law and order and bureaucratic quality, as well as the government's role in corruption, risk of expropriation, and repudiation of contracts. The institutional measure IEF comes from the Heritage Foundation and is on a four-point scale. This index is based on fifty factors that cover ten equally-weighted categories ranging from non-tariff barriers to trade to labor market regulations and more. The third institutional variable, the one used above, is PR, one of the ten sub-indices that make up the IEF. Our last measure of institutions CL comes from Freedom House. Civil liberties is a seven-point index that is based on freedom of expression and belief, association and organizational rights, rule of law, and personal autonomy and individual rights.

Table 6 reports the results of OLS regressions of (4). We see that both *respect for others* and *responsibility* are uniformly significant for all of the institutional measures. The

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[16]Breuer and McDermott (2008) investigate the impact of "intrinsic trustworthiness (which they measure using the WVS question on *respect for others)* on PR and the variable "constraint on the executive" from the Polity IV database. They find it is positive and significant.

Table 6: Values Determine Institutions

	S	IEF	PR	CL
Respect	1.14**	2.79**	4.02**	6.37**
	[0.00]	[0.00]	[0.00]	[0.00]
Responsibility	0.79**	1.54+	2.84*	3.28*
	[0.00]	[0.10]	[0.05]	[0.04]
Constant	-0.79**	0.16	-1.1	-1.52
	[0.00]	[0.77]	[0.20]	[0.20]
Obs.	56	55	55	58
Adj. R^2	0.42	0.34	0.34	0.34
$Prob > F$	0.000	0.000	0.000	0.000
Robust p values in brackets. **significant 1%; * at 5%.				

coefficients are all positive, consistent with our claim that stronger core values will raise the quality of institutions. The core values explain 34-42% of the cross-country variation in institutions.

5.2 Institutions, Production, and Values as Instruments

In this section, we entertain the possibility that the effects of values on *A, k$^\rho$, h,* and *y* may work *only* through institutions. That is, in Figure 1, the linkage between values and behavior may be absent, leaving only institutions as the channel through which values matter. This means that we should replace (3) with:

$$Z_j = a_0 + a_3 I_j + \epsilon_j \tag{5}$$

while retaining (4).

We maintain our assumption in this section that values are exogenous in the sense that there is no reverse causality running from either Z or I back to *respect* and *responsibility*. We do, however, allow for the possibility that there is simultaneous causality between Z and I. In this case, there would some correlation between the error ϵ and I in (5). This is the hypothesis of much recent work, including Hall and Jones (1999), Acemoglu et al. (2001), and Glaeser et al. (2004). To model this, we replace (4) with:

$$I_j = b_0 + b_1 Respect_j + b_2 Respon_j + b_3 Z_j + u_j \tag{6}$$

Whether or not there is simultaneity between Z and I, we can legitimately estimate a *reduced form* of the system (5) and (4) – or (6) – by regressing the outcomes Z on values

alone.

If there is no simultaneity, then this amounts to substituting (4) into (5) and regressing Z on the two core values. In fact, we have already reported these results in Column 3 of each panel in Table 3.[17]

If there is simultaneity between Z and I, so that (6) replaces (4), we estimate an observationally equivalent reduced form. However, if we want to recover the structural coefficient a_3, then we must use two stage least squares. In this case, our two core values are legitimate instruments for resolving the endogeneity problem. Again, this relies on our maintained hypothesis that core values are exogenous. We can regard the results in Table 6 as the first stages of four different two-stage least squares regressions. We are, in other words, replacing Hall and Jones' instruments – *latitude* and *world language* – with our values variables *respect* and *responsibility*. The second stage results of this analysis are reported in Table 7. No matter which institutional measure we use, all work extremely well when instrumented with *respect* and *responsibility* in explaining the four outcome variables. Significance is better than 1% in all cases.

Finally, we ran over-identification tests of the exogeneity of our values as instruments. That test passed in the regressions of A, k^ρ, and y (that is, 12 of the 16 cases) but failed in the equation for h, indicating that *responsibility* should be included directly in the structural regression. That is, for h, (3) might be preferable to (5). We think this is plausible, since human capital accumulation is the outcome that is most directly tied to individual behavior. *Responsibility* appears to have a direct influence on human capital in a way that, for example, *respect* may not have on productivity.[18]

6 Adding Other Values

Our focus so far has been on the two core values we believe to be fundamental to production. A natural criticism of our work is that we may be omitting other values that might work just as well as, or even better than, *respect* and *responsibility*. If these other values are correlated with *respect* or *responsibility*, our earlier coefficient estimates and standard errors may be biased and our conclusions premature. If they are not correlated, (3) may be misspecified.

A second criticism is that our two key values may not be exogenous as we have main-

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[17]The coefficient estimates may be thought of as reduced form estimates π_1 and π_2. Dividing these by β_i from (4), reported in Table (6), gives $\frac{\pi_i}{\beta_i}$. These ratios are estimates of the same thing: the a_3 coefficient on institutions from the OLS regression of (5).

[18]We also ran tests of endogeneity of the institutions in the primary estimating equation (5). In 12 of 16 cases, we accept endogeneity at the 5% level; and 15 out of 16 at the 10% level. The failures were not confined to the human capital equations.

Table 7: Institutions and Output: Two-Stage Least Squares

Institution ↓	Panel A: Dependent = A				Panel B: Dependent = k^ρ			
S	2.13** [0.00]				0.78** [0.00]			
IEF		0.94** [0.00]				0.31** [0.00]		
PR			0.59** [0.00]				0.20** [0.00]	
CL				0.43** [0.00]				0.14** [0.00]
Constant	7.81** [0.00]	6.81** [0.00]	6.78** [0.00]	6.01** [0.00]	-0.13 [0.30]	-0.44+ [0.08]	-0.43* [0.05]	-0.68* [0.04]
Obs.	56	55	58	55	56	55	58	55
Adj. R^2	0.63	0.47	0.25	0.45	0.34	0.02	—	0.03
	Panel C: Dependent = h				Panel D: Dependent = y			
S	0.36** [0.00]				3.26** [0.00]			
IEF		0.15** [0.00]				1.40** [0.00]		
PR			0.10** [0.00]				0.89** [0.00]	
CL				0.07** [0.00]				0.64** [0.00]
Constant	0.48** [0.00]	0.31** [0.00]	0.33** [0.00]	0.2 [0.19]	8.17** [0.00]	5.53** [0.00]	6.67** [0.00]	6.68** [0.00]
Obs.	56	55	58	55	56	55	58	55
Adj. R^2	0.22	0.21	0.15	0.2	0.68	0.42	0.43	0.23
Instruments: *respect for others* and *responsibility*.								
Robust p values in brackets. **significant 1%; * at 5%.								

tained. As with the concern of endogeneity between institutions and economic outcomes, it is possible that *respect for others* and *responsibility* are jointly determined with output per worker, productivity, or capital. Well-educated, productive people in prosperous countries might find it easier to be respectful and responsible. Causality might go, in part, the wrong way. If so, the coefficient estimates and standard errors reported in Tables 3 and 4 are biased.

One way to address both of these criticisms is to introduce the other values from the World Values Survey (2006) into our regressions. The inclusion of other values addresses the possibility of omitted values directly. Including additional values can handle concerns of potential endogeneity as well. Our reasoning is as follows. If productivity, education, and prosperity lead to citizens with better values, then *any* of the values from the World Values Survey (2006) should perform more or less equally in the kinds of regressions in Table 3. That is, *determination* and *hard work*, along with *thrift* and *unselfishness* and *independence,* are all the sorts of qualities that people in rich countries would be expected to hold, if the endogeneity argument were true.

To implement this approach, we estimate equation (3), but include, one by one, each of the other eight values from the list described in Section 3.1.[19] Our results are shown in Table 8, Panels A, B, C, and D. The first column shows the coefficient and p-value for the newly added value (e.g. *independence* in Row 1); the second column shows the same information for *respect*; and the third column for *responsibility*.[20] None of the other values respond in a manner consistent with the endogeneity hypothesis: in only one case (hard work for h) does the added value have both significance and the expected positive sign.

Our two core values, on the other hand, retain the pattern observed earlier. *Respect* is significant and large in magnitude in every regression in the panels for A and y. *Responsibility* is significant and large in the regressions for k^ρ, h and y. We take these results to mean that that (a) our earlier results were not driven by the omission of other important values; and (b) that our two core values are not endogenous.

7 Conclusion

This paper continues recent work on the search for deep determinants of economic growth and development. We show that two core values – *respect for others* and *responsibility* – are highly correlated with productivity, capital, human capital, and output per worker. We suggest that these core values are fundamental and exogenous, and work both directly on

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[19] We exclude *good manners* from the list because it was not asked in sixteen countries in our sample.

[20] In all specifications, the number of observations was either 55 or 56. We do not report the coefficients or p-values for *Property Rights* or the constant, but both were generally positive and significant.

Table 8: Added Values

Added Value ↓	Panel A: Dependent = A			Panel B: Dependent = k^{ρ}		
	Added	Respect	Resp	Added	Respect	Resp
independence	-0.03	1.59**	0.2	0.02	0.33	0.72*
	[0.94]	[0.00]	[0.72]	[0.88]	[0.18]	[0.01]
hard work	-0.74**	1.10*	-0.21	0.05	0.36	0.75**
	[0.00]	[0.03]	[0.65]	[0.70]	[0.13]	[0.01]
perseverance	0.02	1.83**	0.26	-0.32	0.47+	0.76**
	[0.96]	[0.00]	[0.63]	[0.23]	[0.10]	[0.01]
thrift	-0.68+	1.35*	0.37	0.31	0.43	0.64*
	[0.09]	[0.01]	[0.47]	[0.19]	[0.14]	[0.01]
imagination	-0.55	1.59**	0.18	-0.15	0.33	0.78*
	[0.44]	[0.00]	[0.75]	[0.66]	[0.18]	[0.01]
religious faith	-0.46+	1.49**	-0.15	-0.2	0.18	0.59*
	[0.09]	[0.01]	[0.76]	[0.23]	[0.55]	[0.02]
unselfishness	0.27	1.46*	0.26	0.07	0.3	0.74**
	[0.46]	[0.01]	[0.63]	[0.69]	[0.24]	[0.01]
obedience	-0.29	1.60**	0.05	-0.48*	0.34	0.49*
	[0.44]	[0.00]	[0.93]	[0.04]	[0.16]	[0.03]
	Panel C: Dependent = h			Panel D: Dependent = y		
independence	-0.03	0.00	0.41**	-0.04	1.91**	1.33*
	[0.68]	[0.98]	[0.00]	[0.91]	[0.00]	[0.05]
hard work	0.14*	0.09	0.48**	-0.55*	1.55*	1.02+
	[0.02]	[0.56]	[0.00]	[0.04]	[0.01]	[0.08]
perseverance	-0.13	0.19	0.46**	-0.25	2.49**	1.48*
	[0.37]	[0.27]	[0.00]	[0.65]	[0.00]	[0.03]
thrift	-0.08	-0.03	0.42**	-0.45	1.76*	1.43*
	[0.49]	[0.85]	[0.00]	[0.45]	[0.02]	[0.03]
imagination	-0.44**	0.00	0.45**	-1.31+	1.91**	1.40+
	[0.01]	[0.99]	[0.00]	[0.09]	[0.00]	[0.06]
religious faith	-0.02	-0.01	0.39**	-0.68*	1.65**	0.82
	[0.79]	[0.94]	[0.00]	[0.02]	[0.01]	[0.19]
unselfishness	-0.11	0.05	0.37**	0.22	1.81*	1.37*
	[0.36]	[0.78]	[0.01]	[0.59]	[0.01]	[0.04]
obedience	0.05	0.00	0.42**	-0.73	1.93**	0.96
	[0.64]	[0.98]	[0.00]	[0.18]	[0.00]	[0.13]

Property rights and a constant included. ** significant at 1%; * at 5%; + at 10%.

behavior and indirectly through institutions. Our empirical results are strong and consistently support our contention.

In OLS regressions, we showed that *respect for others* and *responsibility* were almost always highly significant and of sizeable magnitude. *Respect for others* works through productivity and *responsibility* works through physical and human capital accumulation. We also showed that the popular measure of *trust* performed very poorly when it was paired with our core values. Next, we investigated whether the presence of core values could mitigate or eliminate the negative effects of societal divisions on inputs to production. The societal division variable we considered was ethnic fractionalization. We found that without the inclusion of core values, ethnic fractionalization was significant and negatively correlated with productivity, capital intensity, and output per worker. When we included the core values, however, ethnic fractionalization was no longer statistically significant. We take this as evidence supporting our claim that good values can overcome the detrimental effects of societal divisions on production. Countries that are more highly fractious than others need not have lower standards of living. The core values they uphold may be more important.

We also examined whether *social infrastructure* (as measured by Hall and Jones, 1999) and the other institutional measures – *index of economic freedom, property rights,* and *civil liberties* – embed core values. In all of our OLS specifications, both core values *respect for others* and *responsibility* were positively and strongly correlated with better institutions. We then considered the possibility that values influence productivity, human and physical capital, and output per worker *only* through institutions, and not directly. Under this hypothesis and the assumption that institutions are endogenous to economic outcomes, our core values become instruments for institutions. In this set-up, we found consistent support that institutions affect the components of production.

Lastly, we consider other individual values that might be taught to children that may be thought important to accumulation and productivity. When we include these other values in our specification, one at a time against our core values, the statistical significance of our core values did not change and the other values were rarely significant (with the expected sign). We take this as strong evidence that *respect for others* and *responsibility* are key factors in the determination of output per worker and that core values are exogenous.

Underdevelopment is persistent. Various theories have been advanced about why this is the case. If core values are the key to economic success, then persistence may reflect the difficulty in changing the fundamental principles by which citizens behave and interact. Values matter.

APPENDIX

Table 9: Values and Output by Country

Country	Respect	Respon	y	$k^{\frac{\alpha}{1-\alpha}}$	h	A	Country	Respect	Respon	y	$k^{\frac{\alpha}{1-\alpha}}$	h	A
Algeria	0.53	0.57	0.25	0.84	0.82	0.36	Japan	0.71	0.91	0.66	1.30	0.84	0.61
Argentina	0.69	0.76	0.42	0.93	1.02	0.44	Jordan	0.67	0.65	0.18	0.85	0.92	0.23
Australia	0.81	0.66	0.67	1.08	0.88	0.71	Korea, Rep.	0.65	0.92	0.46	1.18	0.89	0.44
Austria	0.72	0.87	0.87	1.12	1.06	0.73	Mexico	0.71	0.77	0.29	0.94	0.86	0.36
Bangladesh	0.70	0.53	0.05	0.66	0.60	0.14	Netherlands	0.92	0.87	0.85	1.08	0.81	0.96
Belgium	0.83	0.77	0.89	1.10	1.05	0.77	New Zealand	0.77	0.57	0.56	1.06	0.94	0.57
Brazil	0.59	0.65	0.23	0.96	0.76	0.31	Norway	0.66	0.92	0.82	1.14	0.97	0.75
Bulgaria	0.59	0.76	0.21	0.56	0.84	0.45	Pakistan	0.53	0.50	0.10	0.73	0.60	0.23
Canada	0.82	0.77	0.74	1.07	0.95	0.73	Peru	0.71	0.77	0.17	1.00	0.91	0.18
Chile	0.75	0.84	0.42	0.94	0.96	0.46	Philippines	0.58	0.65	0.14	0.81	0.94	0.18
China	0.72	0.64	0.10	0.93	0.78	0.14	Poland	0.79	0.73	0.25	1.00	0.85	0.29
Colombia	0.68	0.77	0.21	0.78	0.81	0.33	Portugal	0.67	0.64	0.51	1.04	0.84	0.58
Czech Rep.	0.63	0.66	0.36	1.01	0.83	0.43	Romania	0.58	0.62	0.16	1.07	0.83	0.18
Denmark	0.87	0.81	0.75	1.09	0.86	0.80	Russia	0.68	0.76	0.26	1.11	0.89	0.26
Dom. Rep.	0.70	0.85	0.18	0.70	0.83	0.31	Singapore	0.69	0.81	0.88	1.24	0.99	0.72
Egypt	0.64	0.51	0.18	0.55	0.72	0.45	Slovakia	0.57	0.67	0.26	1.10	0.81	0.29
El Salvador	0.59	0.67	0.16	0.63	0.75	0.35	Slovenia	0.70	0.75	0.53	0.99	0.91	0.58
Finland	0.82	0.85	0.67	1.17	0.87	0.66	South Africa	0.72	0.63	0.29	0.66	0.96	0.47
France	0.85	0.73	0.82	1.10	1.01	0.74	Spain	0.79	0.82	0.66	1.08	0.90	0.68
Germany	0.71	0.82	0.76	1.17	0.84	0.77	Sweden	0.92	0.87	0.69	1.07	0.94	0.69
Greece	0.53	0.83	0.48	1.11	1.03	0.42	Switzerland	0.78	0.79	0.75	1.29	0.87	0.67
Hungary	0.66	0.74	0.35	1.05	1.06	0.32	Taiwan	0.59	0.81	0.52	0.82	0.98	0.64
Iceland	0.84	0.81	0.68	1.07	1.05	0.61	Turkey	0.62	0.64	0.18	0.87	0.83	0.25
India	0.58	0.63	0.09	0.68	0.82	0.16	Uganda	0.56	0.55	0.03	0.36	0.65	0.14
Indonesia	0.43	0.72	0.12	0.87	0.82	0.16	United Kingdom	0.79	0.47	0.73	0.97	0.82	0.92
Iran	0.53	0.67	0.26	1.15	0.81	0.28	United States	0.80	0.72	1.00	1.00	1.00	1.00
Ireland	0.75	0.52	0.88	0.90	0.80	1.22	Uruguay	0.69	0.81	0.33	0.83	0.87	0.46
Israel	0.82	0.66	0.77	1.03	0.81	0.92	Venezuela	0.80	0.88	0.27	0.93	0.77	0.38
Italy	0.74	0.81	0.76	1.11	0.88	0.77	Zimbabwe	0.76	0.48	0.11	0.81	0.84	0.16

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